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In re Patent Application of

New York, New York

Richard ORMSON

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Examiner:

For: METHOD OF NETWORK ACQUISITION AND RELATED CELLULAR
RADIO COMMUNICATION DEVICE

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

SUBMISSION OF PRIORITY DOCUMENT

Sir:

In accordance with 35 U.S.C. §119, Applicant confirms the prior request for priority under the International Convention and submits herewith a certified copy of the following document in support of the claim:

UNITED KINGDOM PATENT APPLICATION NO. 0306839.2 FILED MARCH 25, 2003

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Max Moskowitz

Name of applicant, assignee or
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August 25, 2004

Date of Signature

Respectfully submitted,

Max Moskowitz

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1.	Your reference	DAG/P702437GB		
2.	Patent application number (The Patent Office will fill in this part)	0306839.2		
3.	Full name, address and postcode of the or of each applicant (<i>underline all surnames</i>)	NEC Technologies (UK) Ltd Level 3 Imperium, Imperial Way Reading, Berkshire, RG2 0TD		
	Patents ADP number (<i>if you know it</i>)	8362451001		
	If the applicant is a corporate body, give the country/state of its incorporation			
4.	Title of the invention	Method of Network Acquisition and Related Cellular Radio Communication Device		
5.	Name of your agent (<i>if you have one</i>)	W.P. THOMPSON & CO.		
	"Address for service" in the United Kingdom to which all correspondence should be sent (<i>including the postcode</i>)	55 Drury Lane London WC2B 5SQ		
	Patents ADP number (<i>if you know it</i>)	158007 ✓		
6.	If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (<i>if you know it</i>) the or each application number	Country	Priority application number (<i>if you know it</i>)	Date of filing (<i>Day/month/year</i>)
7.	If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application	Number of earlier application	Date of filing (<i>Day/month/year</i>)	
8.	Is a statement of inventorship and of right to grant of a patent required in support of this request? (<i>Answer 'yes' if:</i> a) any applicant named in part 3 is not an inventor, or b) there is an inventor who is not named as an applicant, or c) any named applicant is a corporate body. See note (d))	YES		

**METHOD OF NETWORK ACQUISITION AND RELATED CELLULAR
RADIO COMMUNICATION DEVICE**

The present invention relates to a method for use in network acquisition,
5 and to a related cellular radio communication device.

The dead time that arises between the turning on of a cellular phone
and network acquisition has for sometime been the subject of review and
research in an attempt to limit the extent of such wasted time and its
10 associated problems. For example it has been noted that such dead time is a
cause of irritation to the user, and the longer the time taken to achieve network
acquisition subsequent to turning on the cellular device, the greater the
irritation caused.

Also, the network acquisition procedure conducted during this period is
15 one that requires a significant amount of power to be expended within the
hand set. Thus as handsets move to dual mode or multimode functionality, the
potential for such aforementioned irritation and power expense is likely to
increase yet further. Within dual mode or multimode handsets, there are of
20 course a plurality of sets of frequencies to search and so connecting to the
most attractive cell on the best network will take proportionately longer and the
power consumed will be correspondingly proportionately higher.

Also, certain specifications arising in accordance with mobile network
25 standards also place constraints upon the operation of a mobile handset within
a cellular network, which can also have disadvantageous effect on the above-
mentioned dead time. For example, under 3GPP specifications, a handset is
required to search one entire radio technology (RAT) at a time. The relative
priority of RATs is set within the handset and so, for example, a dual mode
30 GSM/UMTS handset will first search either on the GSM or UMTS radio
technology, and will only look at the second RAT during initial selection if no
suitable cells are found on the first RAT.

attempting network establishment on the basis of the stored details of one of the stored cells;

camping on the said one stored cell if available but attempting network establishment on the basis of the stored details of the other of the cells if the
5 said one stored cell is not available;

camping on the said other of the cells if available; and
conducting a network cell search if none of the stored cells are available.

The invention is particularly advantageous in that, through storing a
10 plurality of previous cell details that were in existence at the time of network loss, the process of network acquisition can be advantageously reduced without limitations currently experienced.

In particular, the pattern of previous network loss can advantageously
15 relate to a particular pattern of travel/usage by an individual such that a limited number of stored cell details can be employed to account for a proportionally, and advantageously, high range of rapid cell acquisitions.

In order not to unduly expend a disproportioned amount of time in
20 checking for a match with stored cell details, the number of cells having their details stored can be advantageously limited.

In particular, the number of cells can be limited to those who's details
can be checked in a period in the region of .5 seconds. In particular, the
25 number of cells can advantageously be limited to 20 or less.

The method can also include the step of ensuring that the details of a
cell to be stored have not previously been stored so as to avoid duplication of
stored data.

30

Also, the method can be employed both where the network loss arises
from the handset moving out of a coverage area, or through the user turning

automatically invoked at the time the user and handset reappear from the tunnel.

5 In particular, if the tunnel is used regularly by the user as part of, for example, their commute to work, the cell details arising at each end of the tunnel will then advantageously be stored in the mobile handset so that réestablishment can be achieved quickly and efficiently both on the user inbound and outbound journey.

10 The stored details for speeding the cell search advantageously comprise identification of the radio access technology and the carrier frequency. Also, details such as WCDMA code, GSM cell identification can be stored to assist with finding the correct network.

15 The invention is described further hereinafter, by way of example only, with reference to the accompanying drawings in which:

Fig. 1 is a flow diagram illustrating the operation of a method embodying the present invention at the time of turning off a handset; and

20 Fig. 2 is a flow diagram illustrating operation of a method according to the present invention at the time of turning on the handset.

Turning first to Fig. 1, there is illustrated a flow diagram arising at the time of turning off a handset.

25

As will be appreciated, such turning off can also equate to the handset losing a network through moving out of a coverage area etc.

30 At step 10, a decision is made to turn off the handset and the user presses the appropriate button to initiate this procedure.

The handset then determines whether network acquisition can be achieved on the basis of one of the stored cells. At step 28, a first of the stored cells is checked. If this stored cell does not allow for acquisition then the procedure continues to step 30 where it is whether or not all stored cells have been checked. If not all stored cells have been checked, then the cell to be checked is incremented at 32 and the next cell then checked at 28. If at 28 it is found that the network can be acquired on the basis if the cell last checked, the network camping and acquisition is concluded at steps 34 and 40. If at step 30 it is determined that all cells have been searched, then a full cell search in the hope of achieving network opposition in the normal manner is initiated at step 36, and omitting those cells already checked at step 28. If at step 36 a full cell search is initiated, it is then determined at step 38 whether a network is found. If so, the procedure continues via steps 34 and 40. However, if a network is not found at 38, the procedure follows the NO route to initiate an out of coverage procedure at step 42.

In instances where a match is therefore found between the cell details previously stored and the cell to which connection is to be made, it should be appreciated that the dead time experienced between turning the handset on and achieving network acquisition is advantageously greatly reduced as is the potential for irritation to the user and the amount of power then employed in the network acquisition procedure.

The present invention therefore advantageously allows the "known cell" mode to operate in more than one location. In storing the cell details at handset turn off for a number of instances of handset turn off – eliminating any duplicate details – the details of cells where the handset user is likely to turn off his phone, and thus of where he is likely to urn it on again, are readily.

30

For example, a traveller flying out of Heathrow will turn off their phone as they board the aircraft. They will then turn it back on at their destination.

Claims

1. A method for use in network acquisition in a cellular radio communications device comprising the steps of:
5 storing details of the cell to which the device was connected at the time of loss of the network for at least first and second separate instances of network loss;
attempting network establishment on the basis of the stored details of one of the stored cells;
10 camping on the said one stored cell if available but attempting network establishment on the basis of the stored details of the other of the cells if the said one stored cell is not available;
camping on the said other of the cells if available; and
conducting a network cell search if none of the stored cells are
15 available.
2. A method as claimed in Claim 1, and including the step of limiting the number of cells whose details are stored.
- 20 3. A method as claimed in Claim 2, wherein the number of cells is limited to a number whose details can be compared with the current cell details such in a period in the region of .5 seconds.
4. A method as claimed in Claim 2 or 3, and including the step of
25 limiting the number of cells whose details are stored to no more than 20.
5. A method as claimed in any one or more of Claims 1-4, and including the step of identifying whether the cell details to be stored
30 have already been stored.

12. A device as claimed in Claim 9 or 10, and including means for limiting the number of cells who's details are stored to no more than twenty.

5

13. A device as claimed in any one or more of Claims 9 to 12, and including means for identifying whether the cell details to be stored have already been sorted.

10

14. A device as claimed in any one or more of Claims 8 to 13, wherein the network loss occurs through movement of the handset out of a coverage area.

15

15. A device as claimed in any one or more of Claims 8 to 13, wherein the network loss arises through the cellular radio communication device being turned off.

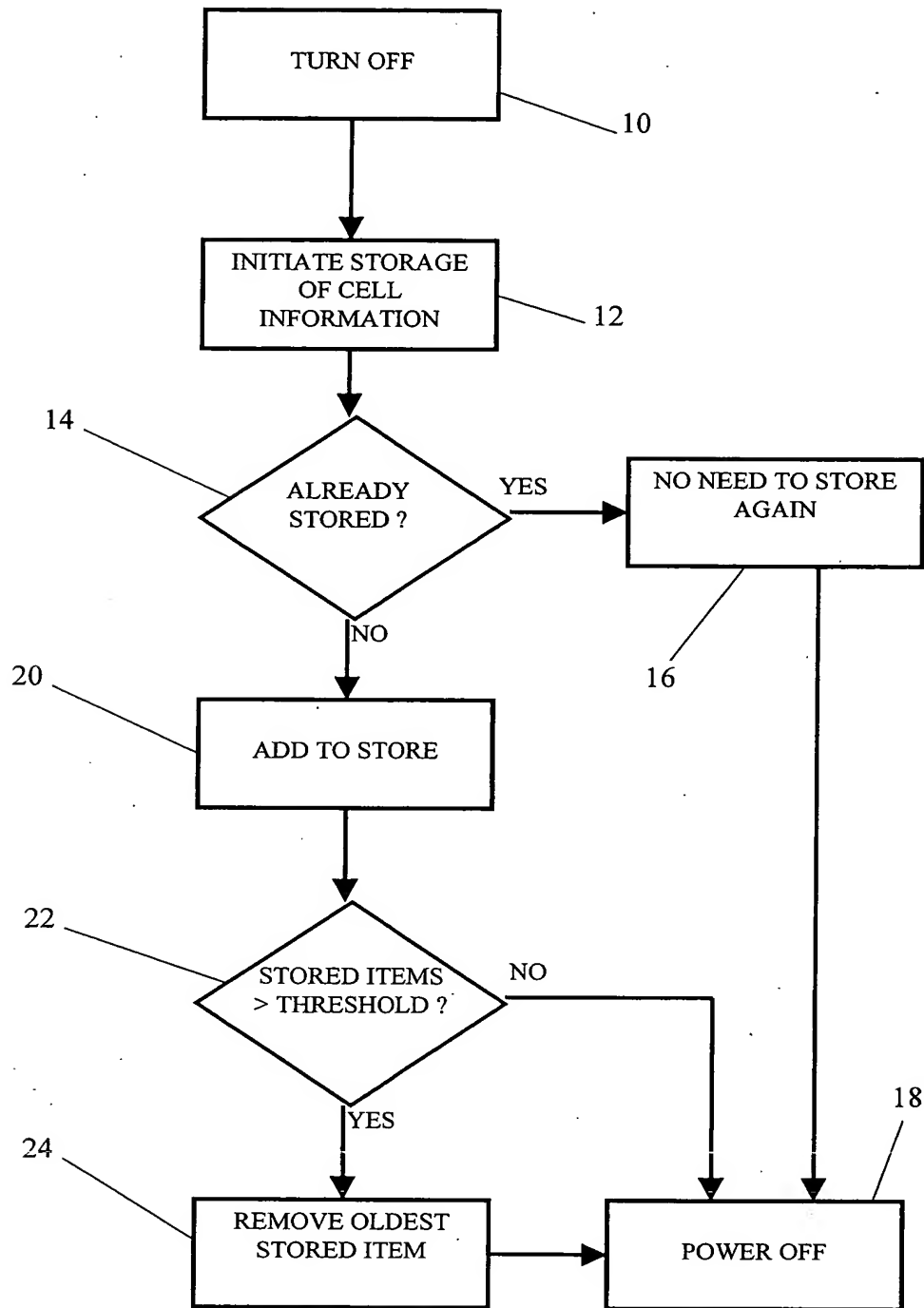
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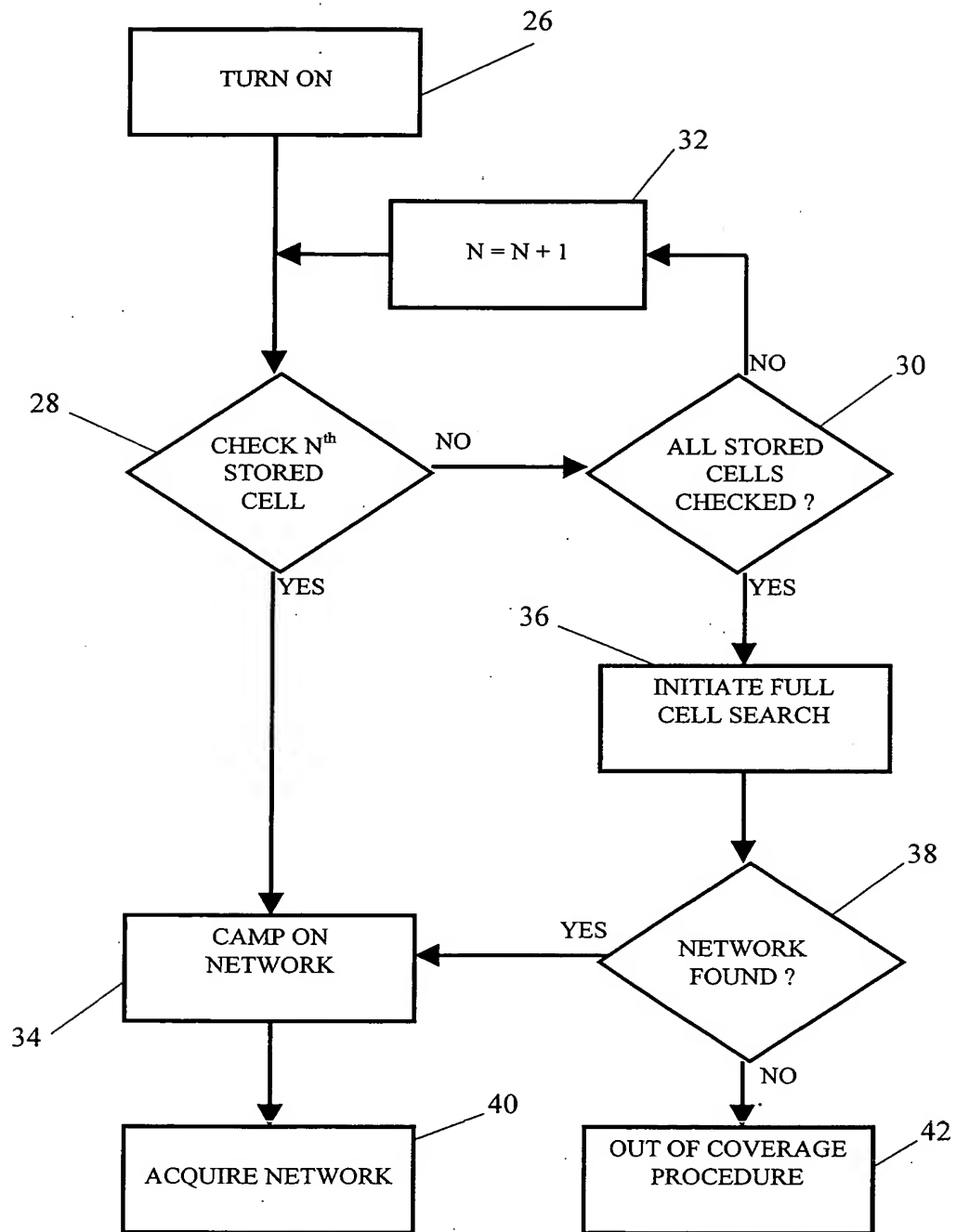
16. A method for use in network acquisition in a cellular radio communications device substantially as hereinbefore described with reference to, and as illustrated in, Figs. 1 and 2 of the accompanying drawings.

25

17. A cellular radio communication device substantially as hereinbefore described with reference to the accompanying drawings.

30

**FIG. 1.**

**FIG. 2.**

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